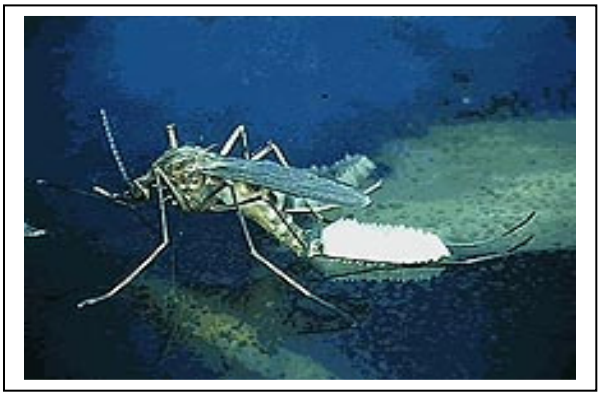
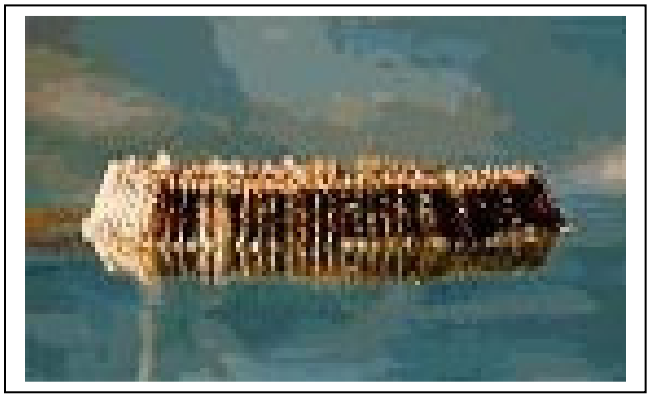
Mosquito Life Cycle

Taxonomically mosquitoes are in the Class Insecta, Order Diptera that include the true flies, usually with two wings, and belong to a family of biting flies, Culicidae. Their metamorphosis involves four distinct stages in their development. Immature stages are aquatic. Elongate, slender eggs are deposited either singly or in clusters, called egg rafts, on damp ground or directly in water. These eggs usually hatch within a day to a week. Some species lay eggs in areas that are occasionally flooded and may not hatch for months or years until favorable temperatures and moisture occurs.

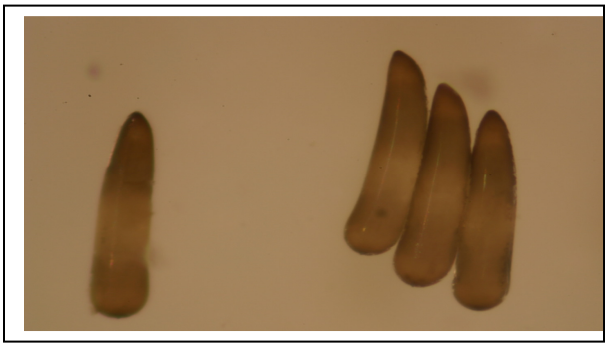
Eggs



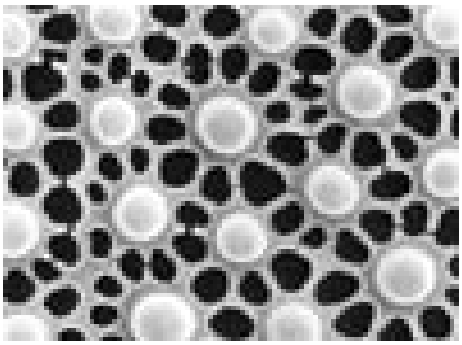
Female laying a raft of eggs.



Egg rafts may contain 50-500 eggs.



Eggs open at the rounded end where the head will emerge.

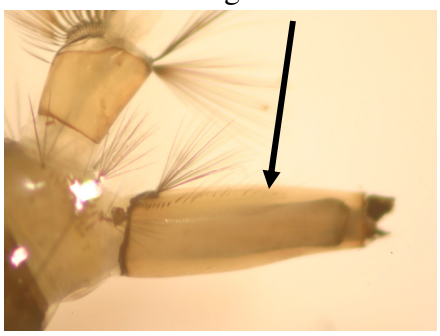


SEM showing egg surface

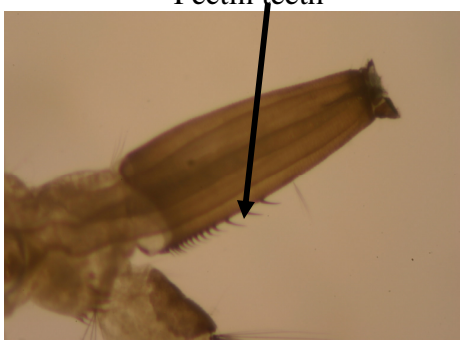
Larvae The growing mosquito larvae or instars molts four times. Larvae are legless and referred to as wigglers. Most settle to the bottom when disturbed and then will wiggle to the surface to breath. Oxygen is taken in the respiratory system through a siphon located at the posterior end of the larvae. Larvae feed on bacteria, algae, small matter composed of decaying plants, and certain species are predaceous on other larvae.

The location and number of siphon hairs and pectin teeth are useful in identification.

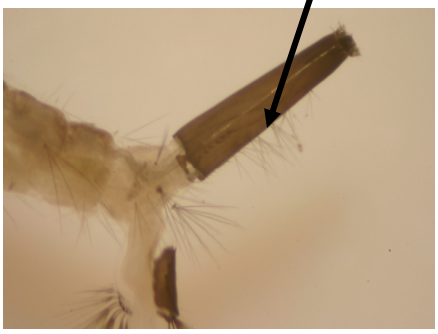
Long hairs

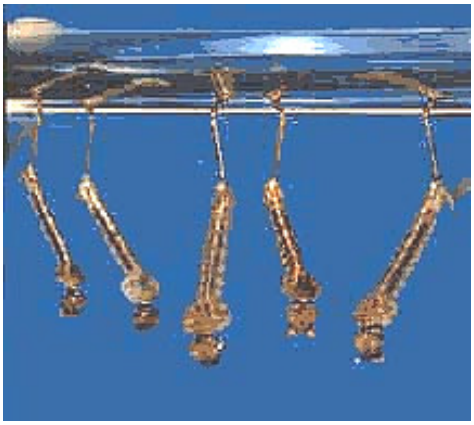


Pectin teeth



Multiple hairs in tufts





Larvae upside down with siphons at water surface.

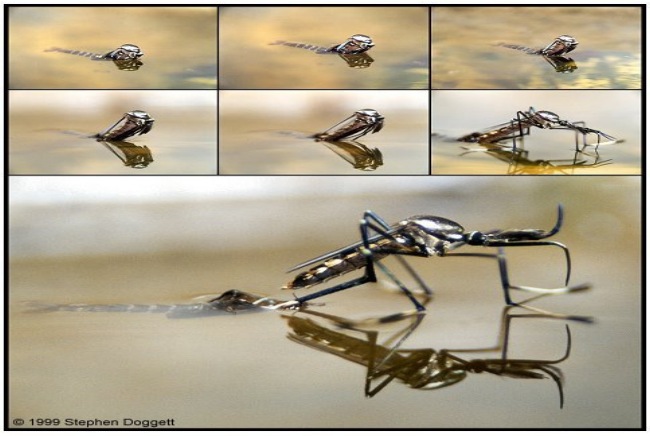
A dipper with many larvae.

Pupae This non-feeding metamorphic stage is referred to as a tumbler. Pupa float to the water surface, breathing occurs through two snorkel like spiracle extensions on the thorax. Rapid contraction of the abdomen with two large terminal swimming paddles rapidly propels them to the bottom when disturbed.

"snorkels"

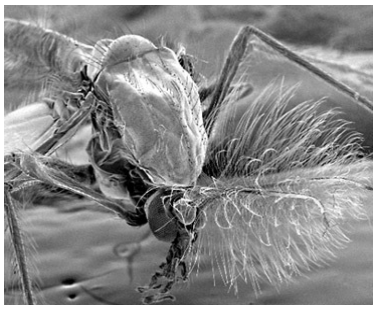
Swimming paddles

Adult male emerging from pupa



Adult This stage may live a few days to months. Several mosquito species survive the cold winter season as adults. Males and females use plant juices as a source of energy. Males have very pronounced feather antennae and do not bite. Many females additionally require protein. This nutrient source is blood, broken down and reconstituted into yolk for egg development! Body odor, and particularly carbon dioxide stimulate sense receptors located on the antennae and palps of female mosquitoes directing them to appropriate hosts. Visual host identification and warm moist air from respiration, provide the necessary cues as they get closer to a suitable blood meal. They puncture skin with styletized mouthparts searching for a tiny blood vessel. Their saliva contains material to prevent blood from clotting and may contain pathogens in some species. Females may take up blood equal to 4X their body weight. Wide spread diseases of malaria, yellow fever, dengue and locally West Nile Virus are spread by certain mosquito species.

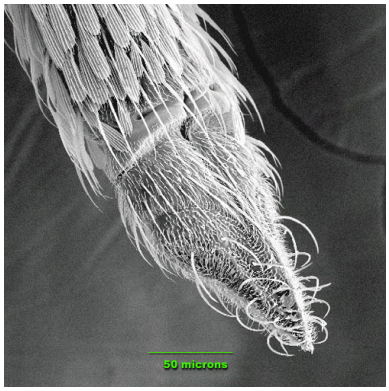
Non biting male mosquito



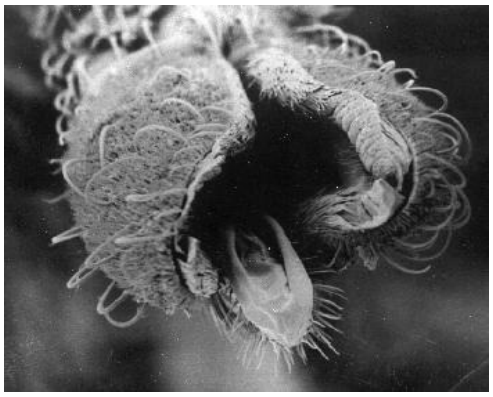
Male “feathery” antennae

Blood engorged female

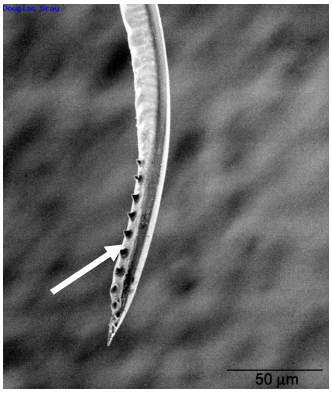
Notice clear stylets forming a tube to transfer blood protected by a sheath, bent in this picture.



Tip of proboscis



Opened up for stylets to begin piercing



Barbs to anchor